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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,514	07/27/2001	Philippe Peltie	034299-337	7058

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EXAMINER

LAVARIAS, ARNEL C

ART UNIT PAPER NUMBER

2872

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/915,514

Applicant(s)

PELTIE ET AL.

Examiner

Arnel C. Lavarias

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/22/03 in Paper No. 15 has been entered.

Oath/Declaration

2. The submission of a new oath/declaration in Paper No. 15, dated 8/22/03, is acknowledged and accepted.

Response to Amendment

3. The amendments to Claim 1 in Paper No. 15, dated 8/22/03, are acknowledged and accepted.

Response to Arguments

4. The Applicant argues that, with respect to newly amended Claim 1, Hoyt in view of Kopf-Sill fails to teach or reasonably suggest a fluorescence image device, including the angle of incidence of the polarized light into the N parallel microchannels being

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approximately 90 degrees relative to the plane defined by the N parallel microchannels.

The Examiner respectfully disagrees. The Examiner notes that no support is provided in the specification for the claimed limitation of 'an angle of incidence of the polarized light into said N parallel microchannels being approximately 90 degrees relative to said plane'.

Further, Hoyt already discloses that the source-polarized light may be made incident onto the sample plate at approximately normal incidence to the plane of the sample plate (See 6A, 6B, 6C, 6D incident on sample 12 on sample plate 13 in Figure 1). It is noted that Kopf-Sill is being relied upon only for the teaching that the sample plate includes means for containing constituents to be analyzed, the means being in the form of N parallel microchannels, i.e. a microchannel plate. Further, the above limitation only discusses how the source-polarized light is incident onto the N parallel microchannels, and that nothing in the limitation points to how the source-polarized light actually propagates after being incident onto the N parallel microchannels. Finally, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

5. Claims 1-15 are rejected as follows.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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7. Claims 1-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 recites the limitation that the angle of incidence of the polarized light into the N parallel microchannels is approximately 90 degrees relative to the plane defined by the N parallel microchannels. The specification of the disclosure fails to provide support for the incident light being incident on the N parallel microchannels at approximately 90 degrees. Additionally, the drawing of the instant application do not clearly show that the incident light is incident on the N parallel microchannels at approximately 90 degrees. Claims 2-15 are dependent on Claim 1, and hence inherit the deficiencies of Claim 1.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-2, 4-5, 8, and 12, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoyt (U.S. Patent Application Publication US2001/0046050 A1) in view of Kopf-Sill et al. (U.S. Patent No. 6358387).

With regard to Claims 1-2, 4, 8, and 12, Hoyt discloses a fluorescence image device comprising first means for containing constituents to be analyzed, such as a sample holder (See for example 13 in Figure 1), second means for illuminating with polarized light the constituents to be analyzed (See for example 10 in Figure 1) and third means for reading out a fluorescence light emitted by the constituents under the action of the polarized light (See for example 18 in Figure 1), the second means having at least one coupling device, such as a diffraction grating, for guiding polarized light into the first means for containing the constituents (See for example 5 in Figure 1; paragraph 0043), the angle of incidence of the polarized light into said sample holder being approximately 90 degrees relative to said plane (See 6A, 6B, 6C, 6D incident on sample 12 on sample plate 13 in Figure 1). Hoyt additionally discloses the second means comprising a laser (See for example 10 in Figure 1) and the third means comprising a birefringent crystal (See for example 20 in Figures 1 or 2), such as calcite (See for example paragraphs 0045, 0049). Hoyt lacks the first means for containing constituents to be analyzed consisting of N parallel microchannels, the structure of the N parallel microchannels defining a plane. However, Kopf-Sill et al. teaches a high throughput analytical apparatus for performing fluorescence detection wherein the means for containing the constituents is a parallel microchannel plate (See Figures 1 and 13) having N parallel channels (See 622 in Figure 13), which is characterized in that the microchannels are etched in a transparent material, such as glass (See col. 7, lines 2-11), and the structure of the N parallel microchannels defining a plane (See top surface of 630 in Figure 13). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to

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incorporate a parallel microchannel plate having N parallel microchannels, the structure of the N parallel microchannels defining a plane, as taught by Kopf-Sill et al. in the fluorescence imaging device as disclosed by Hoyt. One would have been motivated to do this to take advantage of microfluidic analytical techniques, such as small sample volumes, low cost, and ease of fabrication of the microfluidic substrate.

With regard to Claim 5, Hoyt discloses the invention as set forth above, except for the coupling device comprising a cylindrical lens. However, Kopf-Sill et al. teaches a high throughput analytical apparatus for performing fluorescence detection wherein the coupling device comprises a cylindrical lens (See 614 in Figure 13; col. 16, line 46-col. 17, line 25). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a cylindrical lens as the coupling device, as taught by Kopf-Sill et al., in the fluorescence imaging device as disclosed by Hoyt. One would have been motivated to do this to provide excitation light to a longer/larger surface area of the microfluidic substrate.

10. Claims 3, 13, and 14, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoyt in view of Kopf-Sill et al. as applied to Claims 1, 4-5 above, and further in view of Nordman et al. (U.S. Patent No. 6231739).

Hoyt in view of Kopf-Sill et al. discloses the invention as set forth above in Claims 1, 4-5, except for the microchannels being flexible capillaries. However, Nordman et al. teaches a multichannel capillary electrophoresis device for use in fluorescence detection wherein the constituents flow through flexible capillaries (See for example Figures 1 or 2; col. 3, line 62-col. 4, line 57). Therefore, it would have been obvious to one having

ordinary skill in the art at the time the invention was made to incorporate flexible capillaries, as taught by Nordman et al., in the fluorescence image device as disclosed by Hoyt in view of Kopf-Sill et al. One would have been motivated to do this to provide high-pressure fluid flow for sample movement along the microfluidic substrate.

11. Claims 6-7, and 9, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoyt in view of Kopf-Sill et al. as applied to Claim 1 above, and further in view of Modlin et al. (U.S. Patent Application Publication US2001/0007496 A1) and Stabile et al. (U.S. Patent No. 6231739).

Hoyt in view of Kopf-Sill discloses the invention as set forth above in Claim 1. Hoyt-Sill additionally discloses the laser being capable of emitting in a wavelength range between 330-700 nm (See for example col. 18, lines 19-36 of Kopf-Sill). Hoyt in view of Kopf-Sill lacks the third means comprising a first polarizing filter and a second polarizing filter. However, Modlin et al. teaches an apparatus for performing fluorescence polarization measurements wherein the third means for reading out a fluorescence light (See for example 144 in Figure 8) comprises a first polarizing filter (See P filter of 132 in Figure 8) and a second filter (See S filter of 132 in Figure 8). Additionally, Stabile et al. teaches an apparatus for detecting polarized fluorescence light from a sample (See for example Figures 1B or 2), wherein the first and the second polarizing filters are located on a filter wheel (See for example 4B in Figure 2; col. 10, lines 14-34). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a first and a second polarizing filter in a filter wheel as part of the means for reading out the fluorescence light, as taught by

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Modlin et al. and Stabile et al., in the fluorescence image device as disclosed by Hoyt in view of Kopf-Sill et al. One would have been motivated to do this to eliminate polarized background signals from the fluorescence signal, thus increasing the signal-to-noise ratio of the detection system, while allowing for automated selection of the polarizer.

12. Claims 10-11, and 15, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoyt in view of Kopf-Sill et al. as applied to Claims 1, 8, 12 above, and further in view of Modlin et al.

Hoyt in view of Kopf-Sill et al. discloses the invention as set forth above in Claims 1, 8, 12. Hoyt-Sill additionally discloses the laser being capable of emitting in a wavelength range between 330-700 nm (See for example col. 18, lines 19-36 of Kopf-Sill). Hoyt in view of Kopf-Sill lacks a second microlaser for simultaneously illuminating a second area of the microchannel structure. However, Modlin et al. teaches an apparatus for performing fluorescence polarization measurements (See for example Figure 5) wherein a second laser (See 103a-d in Figure 5) simultaneously illuminates a second area of the microchannel structure (See area near 120 in Figure 5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize a second laser to illuminate a second area of the microchannel, as taught by Modlin et al., in the fluorescence image device as disclosed by Hoyt in view of Kopf-Sill et al. One would have been motivated to do this to perform simultaneous top and bottom illumination with simultaneous top and bottom detection of fluorescence signals.

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Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 703-305-4007. The examiner can normally be reached on M-F 8:30 AM - 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 703-305-0024. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1782.



Arnel C. Lavarias
10/6/03

